

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A resin tube-equipped quick connector for connecting a fuel-transporting resin tube to a mating pipe, comprising a connector body, a C-shaped retainer and a seal member;

wherein the connector body has a generally tubular shape as a whole, and has a retainer holding portion adapted to receive and hold the C-shaped retainer at one axial side thereof in an axial-side opening at one axial end thereof, and also has at the other side an opposite axial end thereof, a press-fitting portion which is press-fitted into the interior of the resin tube from one end thereof,

the press-fitting portion extends by a predetermined length L between a ring-shaped end face of the connector body and a ring-shaped end face of the press-fitting portion;

wherein the retainer holding portion includes first and second windows opening through opposite curved sides thereof,

wherein the C-shaped retainer is a member adapted to be held in includes a first arc-shaped portion which projects outwardly into the first window of the retainer holding portion, and a second arc-shaped portion which projects outwardly into the second window of the retainer holding portion, and

wherein the C-shaped retainer is engaged with a convex or concave pipe-side engagement portion, formed on an outer peripheral surface of the mating pipe and spaced from an axial insertion-side end thereof, so as to fix the inserted mating pipe in the axial direction;

wherein the seal member is mounted within the connector body at an inner region thereof disposed closer to the press-fitting portion than the retainer holding portion is disposed, and the seal member is brought into contact with an outer peripheral surface of an insertion end portion of the inserted mating pipe disposed closer to the distal end of the mating pipe than the pipe-side engagement portion is disposed, thereby forming an air-tight seal between the insertion end portion and an inner surface of the connector body; and

the resin tube including a press-fit undergoing portion into which the press-fitting portion is press-fitted,

wherein before the press-fitting portion is press-fitted into the press-fit undergoing portion, when the press-fit undergoing portion is formed with an inner diameter that is substantially equal to an outer diameter of the root portions of the press-fitting portion, and after the press-fitting portion is press-fitted into the press-fit undergoing portion of the resin tube, the press-fit undergoing portion is adapted to cause portions of its inner diameter facing the root portions to become equal to the outer diameter of the root portions, so that and the press-fit undergoing portion is integrated with the press-fitting portion in a withdrawal-preventing condition,

wherein the press-fitting portion extends by a predetermined length L between a ring-shaped end face of the connector body and an ring-shaped end face of the press-fitting portion.

press fitting portion is provided along the length L with the following portions, one immediately after another:

~~a first truncated conical-shaped portion extending from the ring-shaped end face;~~
~~a cylindrical-shaped root portion;~~
~~the plurality of truncated conical-shaped annular projections each followed by a ring-~~
~~shaped face and another cylindrical-shaped root portion;~~
~~a second truncated conical-shaped portion, which ends abutting with the ring-shaped~~
~~end face of the connector body.~~

2. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1, wherein the retainer is elastically deformable radially, and includes

a retainer-side retaining engagement portion which is capable of being fitted to a body-side retaining engagement portion, formed at the retainer holding portion of the connector body, from a radially-inward side to be retained and fixed in the axial direction, and

at least one of an inner peripheral cam surface for elastically expanding the retainer when inserting the mating pipe into the retainer and an outer peripheral cam surface for elastically reducing the diameter of the retainer when inserting the retainer into the retainer holding portion.

3. (Cancelled)

4. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1 or 2, wherein a protector is fitted on the resin tube to cover an outer peripheral surface of the resin tube.

5. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1 or 2, wherein the resin tube has a multi-layer structure an inner layer of the resin tube is more excellent in gasoline resistance than an outer layer.

6. (Cancelled)

7. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1, wherein the resin tube includes an inner diameter of not larger than 5 mm.

8. (Currently Amended) A resin tube-equipped quick connector for connecting a fuel-transporting resin tube to a mating pipe, comprising:

a connector body, a C-shaped retainer and a seal member;

wherein the connector body has a generally tubular shape as a whole, and has a retainer holding portion adapted to receive and hold the C-shaped retainer at one axial side in an axial opening at one axial end thereof, and also has at the an other side axial end thereof, a press-fitting portion which is press-fitted into the interior of the resin tube from one end thereof;

wherein the retainer holding portion includes first and second box-shaped windows opening through opposite curved sides thereof;

wherein the C-shaped retainer is a member for being held in includes a first arc-shaped portion which projects outwardly into the first box-shaped window of the retainer holding portion, and a second arc-shaped portion which projects outwardly into the second box shaped window of the retainer holding portion, and

wherein the C-shaped retainer is engaged with a convex or concave pipe-side engagement portion, formed on an outer peripheral surface of the mating pipe and spaced from an axial insertion-side end thereof, so as to fix the inserted mating pipe in the axial direction;

the seal member is mounted within the connector body at an inner region thereof disposed closer to the press-fitting portion than the retainer holding portion is disposed, and the seal member is brought into contact with an outer peripheral surface of an insertion end portion of the inserted mating pipe disposed closer to the distal end of the mating pipe than the pipe-side engagement portion is disposed, thereby forming an air-tight seal between the insertion end portion and an inner surface of the connector body; and

a press-fit undergoing portion of the resin tube; into, into which the press-fitting portion is to be press-fitted; has, has an inner diameter that is expanded prior to press-fitting, and the press-fit undergoing portion is press-fitted in the tube diameter-expanded press-fit undergoing portion to be integrated therewith in a withdrawal-preventing condition,

wherein the press-fit undergoing portion of the resin tube has a predetermined length L extending lengthwise along the resin tube from a distal end of resin tube, and the inner diameter of the press-fit undergoing portion is expanded by a uniform amount along length L thereof, and

wherein the press-fitting portion extends by a predetermined length L between a ring-shaped end face of the connector body and an ring-shaped end face of the press-fitting portion,portion.

wherein the press-fitting portion is provided along the length L with the following portions, one immediately after another:

~~a first truncated-conical-shaped portion extending from the ring-shaped end face;~~

~~a cylindrical-shaped root portion;~~

~~the plurality of truncated-conical-shaped annular projections each followed by a ring-shaped face and another cylindrical-shaped root portion,~~

~~a second truncated-conical-shaped portion, which ends abutting with the ring-shaped end face of the connector body.~~

9. (Currently Amended) The resin tube-equipped quick connector as claimed in ~~claim 1~~ claim 14, wherein the plurality of annular projections comprises first and second annular projections disposed adjacently to each other, and

the first annular projection is closer to a distal end of the press-fitting portion than the second annular projection.

10. (Currently Amended) The resin tube-equipped quick connector as claimed in ~~claim 8~~ claim 15, wherein the plurality of annular projections comprises first and second annular projections disposed adjacently to each other, and

among the plurality of the annular projections, the first annular projection is closest to a distal end of the press-fitting portion.

11. (Cancelled)

12. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 1, no portion of the press-fitting portion has an outer diameter larger than an outer diameter d_5 of each of the truncated-conical-shaped shaped annular projections.

13. (Previously Presented) The resin tube-equipped quick connector as claimed in claim 8, no portion of the press-fitting portion has an outer diameter larger than an outer diameter d_5 of each of the truncated-conical-shaped shaped annular projections.

14. (New) The resin tube-equipped quick connector as claimed in claim 1, wherein the press-fitting portion is provided along the length L with the following portions, one immediately after another:

a first truncated-conical-shaped portion extending from the ring-shaped end face;

a cylindrical-shaped root portion,
a plurality of truncated-conical-shaped annular projections each followed by a ring-shaped face and another cylindrical-shaped root portion,
a second truncated-conical-shaped portion, which ends abutting with the ring-shaped end face of the connector body.

15. (New) The resin tube-equipped quick connector as claimed in claim 8,
wherein the press-fitting portion is provided along the length L with the following portions, one immediately after another:

a first truncated-conical-shaped portion extending from the ring-shaped end face;
a cylindrical-shaped root portion,
a plurality of truncated-conical-shaped annular projections each followed by a ring-shaped face and another cylindrical-shaped root portion,
a second truncated-conical-shaped portion, which ends abutting with the ring-shaped end face of the connector body.

16. (New) The resin tube-equipped quick connector as claimed in claim 1, further comprising a bushing mounted within the connector body at a region deeper than the retainer holding portion.

17. (New) A coupling structure of a quick connector and a resin tube for connecting a fuel-transporting resin tube to a mating pipe, comprising a connector body, a retainer and a seal member;

wherein the connector body has a generally tubular shape as a whole, and has a retainer holding portion at one axial side thereof, and also has at the other side thereof a press-fitting portion which is press-fitted into the interior of the resin tube from one end thereof,

wherein the retainer is a member adapted to be held in the retainer holding portion, and is engaged with a convex or concave pipe-side engagement portion, formed on an outer peripheral surface of the mating pipe and spaced from an axial insertion-side end thereof, so as to fix the inserted mating pipe in the axial direction;

wherein the seal member is mounted within the connector body at an inner region thereof disposed closer to the press-fitting portion than the retainer holding portion is disposed, and the seal member is brought into contact with an outer peripheral surface of an insertion end portion of the inserted mating pipe disposed closer to the distal end of the mating pipe than the pipe-side engagement portion is disposed, thereby forming an air-tight seal between the insertion end portion and an inner surface of the connector body; and

wherein the resin tube is a small-diameter tube having an inner diameter of not larger than 5 mm,

a press-fit undergoing portion into which the press-fitting portion is press-fitted is beforehand expanded in tube diameter by a beforehand-heated diameter-enlarging pin prior to the press fitting, and

the press-fitting portion is press-fitted into the tube diameter-expanded press-fit undergoing portion to be integrated with the press-fitting portion in a withdrawal-preventing condition.

18. (New) The coupling structure of a quick connector and a resin tube as in claim 17, wherein the retainer is elastically deformable radially, and includes

a retainer-side retaining engagement portion which is capable of being fitted to a body-side retaining engagement portion, formed at the retainer holding portion of the connector body, from a radially-inward side to be retained and fixed in the axial direction, and

at least one of an inner peripheral cam surface for elastically expanding the retainer when inserting the mating pipe into the retainer and an outer peripheral cam surface for elastically reducing the diameter of the retainer when inserting the retainer into the retainer holding portion.

19. (New) The coupling structure of a quick connector and a resin tube as in claim 17, further comprising a protector fitted on the resin tube to cover an outer peripheral surface of the resin tube.

20. (New) The coupling structure of a quick connector and a resin tube as in claim 17, where the resin tube has a multi-layer structure, having at least an inner layer and an outer layer, the inner layer being more resistant to gasoline than is the outer layer.

21. (New) The coupling structure of a quick connector and a resin tube as in claim 17, wherein the resin tube comprises a polyamide resin

22. (New) The coupling structure of a quick connector and a resin tube as in claim 17, wherein the press-fitting portion comprises:

annular projections formed respectively on a plurality of axially-different portions of a outer peripheral surface of the press-fitting portion,

wherein an outer diameter d_6 of a root portion provided between adjacent annular projections and an inner diameter d_3 of the tube diameter-expanded press-fit undergoing portion are substantially the same, and

wherein an axial length L of the press-fitting portion and an axial length L of the press-fitting undergoing portion are substantially the same.